Claims:

1. A method of performing vision processing comprising:

producing a depth map of a scene proximate a platform, wherein the depth map is based on an assumed ground plane:

identifying an actual ground plane using the depth map; and compensating the depth map for differences between the assumed ground plane and the actual ground plane.

- 2. The method of claim 1 further including the step of comparing the depth map to a plurality of templates to identifying a match between the depth map and at least one template.
- 3. The method of claim 2 further including the step of adjusting a parameter of the platform in response to a match.
- 4. The method of claim 2 wherein the parameter of the vehicle comprises at least one parameter selected from the group of: an air bag deployment parameter, a seatbelt parameter, a vehicle height parameter, and a vehicle velocity and/or acceleration control parameter.
- 5. The method of claim 2 wherein the comparing step includes determining a difference between each pixel in the depth map and each similarly positioned pixel in a template, and determining that a pixel is a match if the difference at each pixel is less than a predefined amount.
- 6. The method of claim 2 further comprising: accessing at least one template from a database comprising a plurality of templates.
- 7. The method of claim 6 wherein the plurality of templates represent objects at varying positions and poses relative to the platform.
- 8. The method of claim 6 wherein at least one template in the plurality of templates

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is a model of a vehicle.

- 9 The method of claim 6 wherein at least one template in the plurality of templates is a model of a pedestrian.
- 10. The method of claim 1 further including the step of removing the actual ground from the depth map.
- 11. A method of performing vision processing comprising: stereo imaging a scene about a platform to produce stereo image data; producing a map of data from the stereo image data, wherein the map is based on an assumed ground plane;

identifying an actual ground plane using the map;

compensating the map for differences between the assumed ground plane and the assumed ground plane; and

removing the actual ground plane from the map.

- 12. The method of claim 11 further including the step of comparing a plurality of templates to the map to identifying a match between the map and at least one template.
- 13. The method of claim 12 further including the step of adjusting a parameter of the platform in response to a match.
- 14. The method of claim 13 wherein the parameter of the vehicle comprises at least one parameter selected from the group of: an air bag deployment parameter, a seatbelt parameter, a vehicle height parameter, and a vehicle velocity and/or acceleration control parameter.
- 15. The method of claim 12 wherein the comparing step includes determining a difference between each pixel in the map and each similarly positioned pixel in a template, and determining that a pixel is a match if the difference at each pixel is less than a predefined amount.

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16. The method of claim 13 further including accessing at least one template from a database comprising a plurality of templates.

- 17. A collision avoidance system comprising:
 - a collision detection system comprising:
 - a stereo camera pair for producing imagery of a scene;
 - a stereo image preprocessor for preprocessing said imagery;
- a map generator for producing from said preprocessed imagery a map referenced to an assumed ground plane; and
 - a target processor for determining the actual ground plane from said map.
- 18. A system according to claim 17, wherein the target processor removes the actual ground plane from the map.
- 19. A system according to claim 17, wherein the collision detection system further includes a collision detector for determining if a collision is imminent;

wherein said collision detector detects a potential threat in said map;

wherein said collision detector estimates size, position, and velocity of said detected potential threat;

wherein said collision detector performs a trajectory analysis of said detected potential threat using said estimated position and said estimated velocity;

wherein said collision detector predicts a collision based on said trajectory analysis; and

wherein said collision detector determines if a collision is imminent based on said collision prediction and on said estimated size.

- 20. The system according to claim 19 further including a secondary sensor that provides said collision detector with information regarding the scene.
- A computer readable medium storing a vision system program that controls a 21. computer to:

produce a depth map from input imagery; determine an actual ground plane from said depth map; and correct the depth map based on the actual ground plane.

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22. A computer readable medium according to claim 21 that further controls a computer to;

detect a potential threat in said corrected depth map;

estimate a size of said detected potential threat;

estimate a position of said detected potential threat;

estimate a velocity of said detected potential threat;

perform a trajectory analysis of said detected potential threat using said estimated position and said estimated velocity;

perform a collision prediction based on said trajectory analysis; and determine if a collision is imminent based on said collision prediction and on said estimated size of said potential threat.

- 23. The computer readable medium of claim 20 that further controls a computer to remove the actual ground from the corrected depth map.
- 24. A collision avoidance system comprising:
 - a collision detection system comprising:
 - a stereo camera pair for producing imagery of a scene;
 - a stereo image preprocessor for preprocessing said imagery;
- a map generator for producing from said preprocessed imagery a map referenced to an assumed ground plane; and
- a target processor for determining the actual ground plane from said map and for removing that ground plane from said map.
- 25. A computer readable medium storing a vision system program that controls a computer to:

produce a depth map from input imagery; determine an actual ground plane from said depth map; and removing the actual ground from the depth map.

26. A method of performing vision processing comprising:

producing a depth map of a scene proximate a platform, wherein the depth map is based on an assumed ground plane;

identifying an actual ground plane using the depth map; and correcting the original stereo images for differences between the assumed ground plane and the actual ground plane.

- 27. The method of claim 26 wherein the technique of correction is a vertical translation of the original stereo images.
- 28. The method of claim 27 wherein the corrected stereo images are processed to refine the estimated height and width of the target.
- 29. A collision avoidance system comprising:
 - a platform;
- a collision detection system on said platform, said collision detection system comprising:
 - a stereo camera pair for producing imagery of a scene;
 - a stereo image preprocessor for preprocessing said imagery;
- a map generator for producing from said preprocessed imagery a map referenced to an assumed ground plane; and
- a target processor for determining the actual ground plane from said map and for correcting the original stereo images based on the actual ground plane.
- 30. A computer readable medium storing a vision system program that controls a computer to:

produce a depth map from input imagery;
determine an actual ground plane from said depth map; and
correcting the original stereo images based on the actual ground plane.